WCB ReSearch Secretariat

Research Report 2002

Message from the Chair

With our second research competition attracting twice as many proposals as our first, the program is fast becoming a major source of funding for occupational health research in B.C. The WCB Research Secretariat has now awarded approximately $2.6 million to 21 research projects.

The overall aim of our program is to not only fund research to reduce work-related injury and disease, but also to develop a cadre of top-ranked occupational health researchers. To do this, two new funding streams have been introduced this year. The first will offer funds to develop new research protocols and interventions to make B.C. workplaces safer and healthier. The second will provide scholarships for graduate students intending to specialize in occupational health-related research.

While we have made significant progress, our program still needs to grow — particularly in its capacity to meet the challenge of knowledge transfer. We still need to find novel and effective methods to ensure that research leads to changes that will result in safer, healthier workplaces and that knowledge exchange takes place between researchers and end-users before, during, and after the research process.

Over the next year, we will focus on enhancing links and strategic partnerships with other research-funding bodies as well as with our stakeholders. Through these collaborative efforts, we will continue to strengthen our program's ability to focus the power of research on resolving key occupational health and safety challenges.

— **Richard Gallagher**, *chair of the Research Advisory Committee, and head of the Cancer Control Research Program at the BC Cancer Agency*

■ About the WCB's Research Secretariat

The Research Secretariat is responsible for overseeing research and related activities at the WCB. The Secretariat's mission is to generate new knowledge on occupational health and safety and workers' compensation issues by funding high-quality, scientifically valid research. The Secretariat is also charged with translating that knowledge into relevant, practical applications that can be used to prevent injury and illness in the workplace, ensure fair and equitable compensation, and foster successful rehabilitation and return to work for injured workers.

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Scientific review at the core of research competition

The Research Secretariat awards funds through a competitive process, which emphasizes transparency, accountability, relevance to the workplace, and, above all else, scientific credibility. Applications for funding are subjected to a rigorous multi-stage review:

Preliminary review: The Research Secretariat reviews each application for completeness and compliance with the competition guidelines.

Peer review: Proposals that pass the Secretariat's preliminary review are then evaluated for scientific excellence by at least two external experts. The reviewers, who are drawn from the international scientific community, are asked to write an evaluation of each proposal and to grade it according to established scientific guidelines and criteria.

Relevance review: Applications that pass scientific review are finally screened for relevance by a cross-divisional committee of WCB staff and by worker and employer stakeholders on the Research Advisory Committee (RAC). Members of the cross-divisional committee are asked to review the proposals and to advise the RAC on how relevant the projects are to the WCB. Members of the RAC are asked to review the proposals, taking into account the peer reviewer comments and the advice of the internal review committee. The RAC then ranks the proposals and makes recommendations to the Secretariat on funding.

Based on the RAC's advice, recommendations are then brought forward to the Board of Directors (the WCB's new governing body) for a decision on funding.

Research priorities set direction

To ensure that research projects are relevant to the needs of the WCB and our stakeholders, the Research Secretariat has established five research priorities for the competition. Preference for funding is given to research proposals that fall under one or more of the following categories:

Occupational disease, injury, and health services — Research focusing on the biological, medical, and health care factors in the causation, prevention, diagnosis, and treatment of work-related injury and disease.

Intervention research — Research focusing on the most effective way of using knowledge about occupational injury and disease to intervene with prevention programs.

Compensation, disability management, and return to work — Research focusing on compensation levels, disability management, and sustained return to work for injured or ill workers.

Changing nature of work and work environment — Research focusing on the changing nature of work and the work environment (technological, social, demographic, etc.) and its impact on occupational health and safety.

Transferring research knowledge to the workplace — Research focusing on the transformation of knowledge into practical, accessible solutions for preventing workplace injury and disease.

Detailed information on the WCB's research priorities can be found on our web site at www.worksafebc.com/research/research_program/research_priorities/default.asp.

Funded Projects

In 2002, the WCB approved a total of $1.2 million in funding for 12 research projects. Of the 12 approved projects, 11 accepted funding, which brings the total number of projects currently funded through the program to 21.

Investigating the consequences of work-related injuries among young workers in British Columbia

Principal Investigator:
Mieke Koehoorn (University of B.C.)

Purpose:
To examine the experience of young workers in B.C. and to evaluate the long-term health consequences of being injured on the job.

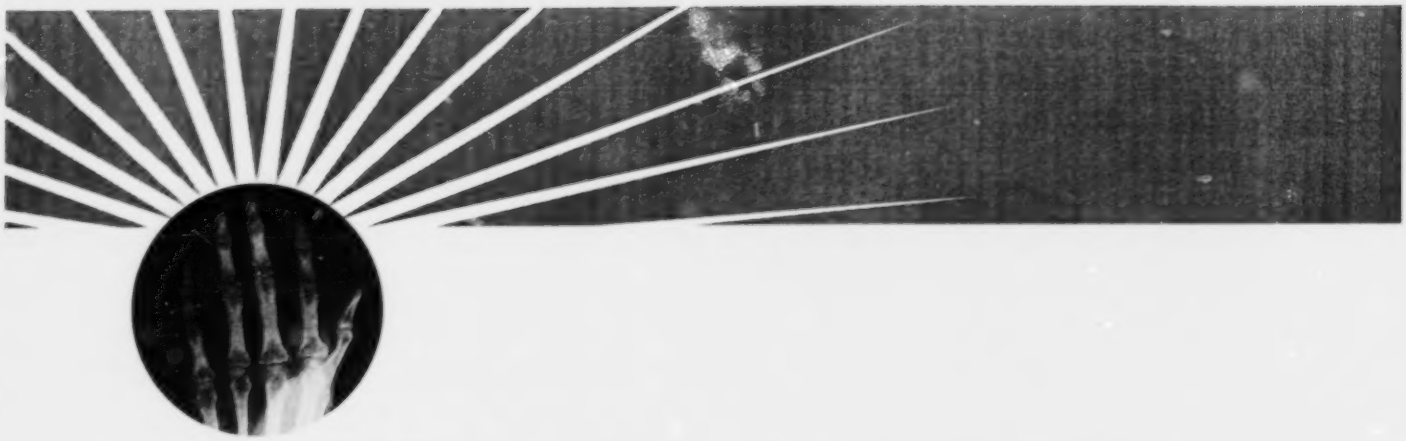
Abstract:
Workers' compensation data indicate young workers are at a higher risk of injury than older workers. Yet, to date, little research has been conducted on the long-term consequences of these injuries. Using the BC Linked Health Database, this project will investigate and compare general health care utilization following a work-related injury among B.C. claimants aged 15 to 24 years over a 15-year follow-up period (1986–2000) and a matched group of non-claimants. The comparison population will be matched by age, gender, and geographic residence. For the claimant population, claim experiences by demographic, occupational, and injury factors will be described. Using the longitudinal data files, the research team will describe patterns of health care utilization among both groups and, using multivariable models, will investigate if a worker's compensation claim is a significant predictor of increased health care utilization. A better understanding of the long-term impact of work-related injuries will provide important information about the need to establish priorities and devote resources to prevention and regulatory efforts aimed specifically at young workers.

Biomechanics of ankle reconstruction

Principal Investigator:
Alastair Younger (University of B.C.)

Purpose:
To test whether a new technique for repairing injured ankle ligaments is biomechanically more stable than the standard technique and whether the repaired ankle is as strong as a normal uninjured ankle.

Abstract:
Injury of the ankle ligaments is among the most common injuries seen by physicians. Persistent functional instability of the ankle develops in approximately 20 percent of patients and many eventually require surgical treatment. This research will evaluate the biomechanical characteristics of a new reconstructive technique developed by the research team, in which the gracillis tendon is harvested and inserted through the calcaneus and fibula to reconstruct the anterior talofibular ligament (ATFL) and the calcaneofibular ligament (CFL). Cyclic moments will be sequentially applied to six pairs of cadaveric foot and ankle specimens and the motion of the fibula and talus with respect to the calcaneus will be monitored. After these tests, a moment of inversion and plantarflexion will be applied to the specimens until failure. Each ankle will be tested in this fashion for the intact state and again after repair, using either the Brostrom technique or the new technique. Joint stability (as measured by the relative motions between these bones) and the failure moments for the two techniques will be compared. If the study finds the new technique to result in greater strength and stability than the Brostrom method, a clinical trial would subsequently be conducted to evaluate whether it would allow for earlier patient rehabilitation and return to full function.



Early mobilization of hand fractures

Principal Investigator:
Samuel Sheps (University of B.C.)

Purpose:
To examine the prevalence and cost of hand fractures in B.C. and to evaluate whether there is sufficient evidence from controlled clinical trials that early mobilization of hand fractures enhances healing and improves function.

Abstract:
Between 1995 and 1999 in B.C., there were 8,968 work-related upper extremity "fracture or fracture dislocation" WCB claims. These claims accounted for 11 percent of upper extremity trauma claims in B.C. However, these same injuries account for 32 percent of all days lost from work for upper extremity traumatic claims. On average, each claim costs $12,000 and results in 73 days of lost time. Using WCB databases alone, it is difficult to identify all work-related hand fractures and to determine their impact on claim duration and cost. To address this gap, a retrospective review and analysis of data on hand fractures will be conducted. Data on the distribution of people seeking medical attention for a hand fracture, the mechanism of injury codes, the number of identified work- and non-work-related hand fractures, and acute health care utilization trends will be collected from the BC Linked Health Database. For selected work-related hand fractures, claim and health care services payment data will be reviewed to analyze claim duration, costs, and health care utilization trends. The researchers will also undertake a systematic and critical review of the literature to evaluate if there is sufficient clinical evidence that early controlled mobilization of hand fractures affects healing status or functional outcomes. If such evidence exists, it would then lead to the formulation of evidence-based practice guidelines for this treatment option.

Profiling the mental health and service utilization of workers' compensation claimants

Principal Investigator:
William Gnam
(Centre for Addiction and Mental Health)

Purpose:
To examine whether WCB claimants use mental health services differently than non-WCB claimants and whether the treatment provided to injured workers for depression influences the amount of time lost from work.

Abstract:
In advanced market economies, there are numerous indicators that injured workers have mental health problems that significantly influence their health, functioning, and occupational outcomes. Often these mental health problems are undetected or inadequately treated. To date, no studies have examined whether appropriate treatment of depression reduces disability and lost work time. Using administrative databases, this study will establish how frequently WCB claimants use mental health services and whether the appropriate treatment of depression influences the amount of time lost from work. Patterns and frequency of use will then be compared to a population of non-claimants matched by age, sex, and geographical residence. Analysis of these data will improve our understanding of claimants' treated mental health problems before and after their injury. This knowledge will be vital to enhancing the mental health services available to injured workers and to identifying groups of injured workers at risk for mental health problems. The investigators will also examine the impact of depression treatment before or after injury on lost-time claim duration and whether guideline-level treatment practices for depression affect the duration of claims. This analysis will provide information vital to improving the access of injured workers to appropriate treatment.

Long-term impact of western red cedar asthma on work, health, and quality of life

Principal Investigator:
Helen Ward (University of B.C.)

Purpose:
To examine the long-term impacts of exposure to western red cedar and to provide insights into the effectiveness of protective measures, such as respirators.

Abstract:
Western red cedar (WRC) asthma is the most prevalent form of occupational asthma in British Columbia. Continued exposure to WRC dust is generally associated with the worsening of asthma. This study will follow up B.C. workers diagnosed with WRC asthma since 1972 to obtain information on their current respiratory health and quality of life. Presently, little is known about how many are still working in B.C., how many remain exposed to WRC dust, what respiratory protective equipment is used, what respiratory symptoms they may still have, whether there are respiratory limitations in activities of daily life, and how quality of life is affected. Using standard survey instruments, information on the workers' current work and exposure status, use of respiratory protective equipment, presence of respiratory symptoms, and overall quality of life will be collected through telephone interviews. Analysis of these data will provide information on long-term health outcomes and quality of life, according to if, where, and when workers were employed since diagnosis with WRC asthma. The study findings will offer guidance for the development of an optimal and comprehensive patient follow-up program, including appropriate recommendations about return to work, and the effectiveness of protective measures.

Cancer and occupational exposure to pentachlorophenol and tetrachlorophenol

Principal Investigator:
Paul Demers (University of B.C.)

Purpose:
To determine whether occupational exposure to pentachlorophenol (PCP) and/or tetrachlorophenol (TCP) is associated with an increased risk of cancer in a pre-existing cohort of 26,000 B.C. sawmill workers.

Abstract:
Between 1950 and 1990, approximately 100,000 people were exposed to chlorophenol fungicides in B.C.'s lumber industry. Some studies have found that exposure to chlorophenols may increase the risk of several types of cancer, though the evidence is not definitive. This study will use a pre-existing cohort of 26,000 B.C. sawmill workers. Historical records will be reviewed to identify fungicide formulations used during different periods in each mill. These data will be used to assign PCP and TCP exposure levels to the work histories of each individual. Standardized incidence and mortality ratio analyses will be performed, with B.C. male cancer rates used as the reference population. Analyses will be stratified by age, time period and duration of employment, years since first employment, workplace, and job category. Poisson regression will be used to examine dose-response relationships. Analyses will focus on cancer sites of a priori suspicion (non-Hodgkin's lymphoma, soft tissue sarcoma, sino-nasal cancer, lung cancer, and Hodgkin's disease). Cancer risks will be examined in relation to quantitative indices of exposure to PCP, TCP, and any chlorophenol. If evidence of an increased risk emerges, it will allow enhanced primary prevention of future cancers and secondary prevention of mortality or morbidity among exposed persons.

Lift devices to reduce MSIs among home support workers in B.C. — a community intervention

Principal Investigator:
Nancy Paris-Seeley (B.C. Institute of Technology)

Purpose:
To field test a newly designed manual lifting device and to examine injury rates, compensation costs, and psychological variables associated with the use of this device, compared with the use of an automated device.

Abstract:
Home support workers (HSWs) assist persons with rehabilitation and activities of daily living. Their work involves lifting, twisting, and carrying heavy, often unpredictable, clients. Because HSWs work alone, often having no equipment to assist them with lifting and transferring, they are at increased risk for developing back injuries. To address this issue, members of this research team recently designed a manually operated lifting device. In this study, which is part of a multi-site intervention, manual lift devices will be installed in the homes of 20 high-risk home care clients who agree to participate. Ergonomic education and training will be provided to their HSWs (approximately three per client). Data on musculoskeletal injuries, total compensation costs, and psychological barriers to acceptance of lift/transfer aids will be collected at baseline and again six months and one year after the intervention. To determine the relative effectiveness of the device, results will be compared with those from a similar intervention using automated lifting devices.

Arthroscopic subacromial decompression with and without an acromioplasty

Principal Investigator:
Jordan Leith (University of B.C.)

Purpose:
To compare two methods of treating shoulder impingement syndrome to determine if a less invasive procedure is as effective as the more conventional treatment.

Abstract:
Shoulder impingement syndrome, a common cause of shoulder pain and dysfunction, is estimated to cost the WCB more than $10 million per year. Most WCB patients diagnosed with impingement syndrome undergo an arthroscopic subacromial decompression (ASAD) treatment with an acromioplasty. However, acromioplasty disrupts the periosteum and cortical bone of the acromion, exposing a large surface of raw cancellous bone, which may predispose the subacromial space to extensive scar formation. The study, a prospective randomized single-centre clinical trial, will compare health and functional outcomes associated with ASAD treatment with and without an acromioplasty. Patients meeting the inclusion criteria will be randomly assigned to the two treatment groups. Post-operatively, patients in both groups will follow identical one-year follow-up and physiotherapy regimens. Specific outcomes of interest — change in pain, differences in shoulder function before and after surgery, and health-related quality of life — will be measured using standardized and validated survey instruments. If found to be effective, the less morbid treatment could reduce treatment costs and recovery time.

Selective nerve root blocks treatment of acute sciatica

Principal Investigators:
Maziar Badii (Arthritis Research Centre of Canada)
Paul Bishop (Vancouver Hospital)

Purpose:
To investigate whether a new treatment for acute sciatica is effective in improving functional status, reducing sciatica pain, returning patients to work, and preventing surgery.

Abstract:
Every year in B.C., many workers suffer from lower back injuries that cause pain down the leg. This condition, also known as sciatica, usually results in an average of three to four months lost from work. In approximately 15 percent of cases, surgery is required to relieve the pain and to regain normal function. This study is designed to evaluate the effectiveness of a new treatment involving a special injection into the spine around the injured nerve. Patients meeting the inclusion criteria will be stratified into three groups according to duration of symptoms and randomized in variable blocks of two and four to receive the treatment or a placebo. Patients, the anesthetist performing the intervention, and physicians performing assessments will all be blinded to treatment. Outcomes of interest are functional improvement at six weeks, functional status at six months and one year, quality of life, return to work, and progression to surgery. Univariate and multivariate regression will be used to compare treatment groups before and after adjustment for baseline variables, and to examine the effect of non-randomized baseline variables. The results of this study will provide evidence as to whether the treatment reduces recovery time and the need for surgery.

The effect of subject awareness in assessing the probability of slip and fall accidents

Principal Investigator:
Gunter Siegmund (University of B.C.)

Purpose:
To quantify the effect of subject awareness on the probability of slipping and falling on low-friction surfaces and to validate three types of meters used in the design and specification of shoes and flooring materials.

Abstract:
Most slip and fall accidents in the workplace occur unexpectedly. However, most studies of slip and fall accidents use human subjects who are aware they are about to slip. This difference in accident-victim and research-subject awareness potentially undermines the validity of slip and fall research. The primary goal of this project is to quantify the difference between unexpected and expected slips. This goal will be achieved in two ways. First, the effect of expectation on the probability of slipping and falling will be examined by having 75 normal, healthy subjects walk over a surface which is much slipperier than they expect, and then comparing the outcome to subsequent trials in which they expect a slippery surface. Second, the way subjects alter their gait when expecting to slip will be evaluated by comparing how subjects walk when there is no risk of slipping to how they walk when there is a risk of slipping. Additional data from forewarned slip tests will then be acquired, corrected for the observed expectation effects, and used to validate special devices that measure shoe/floor friction. These devices can then determine appropriate shoe/floor combinations to prevent or minimize future slip and fall accidents in the workplace.

Expression of EGFR and VEGF in malignant pleural mesothelioma: defining potential therapeutic targets

Principal Investigator:
Christopher Lee (BC Cancer Agency)

Purpose:
To confirm that two proteins, epidermal growth factor receptor (EGFR) and vascular endothelial growth factor (VEGF), are over-expressed in malignant pleural mesothelioma (MPM) and to examine the relationship between these proteins and survival.

Abstract:
Malignant mesothelioma, which is strongly associated with asbestos exposure, is a cancer of the pleura or peritoneum (the linings around the lungs and abdominal cavity). Surgery for malignant mesothelioma is often not possible, and current drug treatment (chemotherapy) is of limited value. The average life expectancy from time of diagnosis is between four and 18 months. Several new anti-cancer drugs are being tested in human studies. These drugs either inhibit signals sent to cancer cells to grow and divide, or block the formation of new blood vessels needed for tumour growth. In this study, standardized staining procedures and scoring scales will be used to determine if EGFR and VEGF are over-expressed in patients with MPM. Pleural biopsy specimens will be obtained from 50 patients with MPM, who meet the inclusion criteria and who consent to participate. Statistical analyses will be performed to examine the relationship between the various parameters under study (e.g. a positive score for EGFR or VEGF, active treatment for MPM, etc.) and overall survival. Findings will help define therapeutic targets in the treatment of MPM and will advance knowledge of the biology of the disease.

2000–2001 Research Competition

The Research Secretariat held its first competition in 2000–2001, awarding approximately $1.4 million in funding to 10 research projects. Projects funded in 2001 are expected to begin reporting results in 2003, and include studies in the following areas:

Prevention and intervention

- Lift devices to reduce musculoskeletal injuries (MSIs) among B.C. home support workers (B.C. Institute of Technology) — Stage 1: Design
- Shift work practice in B.C. (Simon Fraser University)

Occupational risk factors for injury and disease

- Prevalence, nature, and risks of voice problems among teachers (University of B.C.)
- Parkinson's disease — workplace risk factors and host susceptibility (University of B.C.)
- Measuring respiratory health at B.C. workplaces (University of B.C.)
- A retrospective cohort study of cancer risks among nurses in B.C. (University of B.C.)
- Occupational risk identification for ovarian cancer (BC Cancer Agency)
- A case-control study to identify agricultural chemicals associated with an increased risk of prostate cancer and in vitro screening of their endocrine disruption activities (BC Cancer Agency)

Diagnosis and treatment of occupational injury and disease

- EMG-based assessment and classification of low back pain (Simon Fraser University)

Compensation, disability management, and return to work

- Workplace injury management — using new technology to deliver physician education (University of B.C.)

See our Fall 2001 Research Report located on our web site at www.worksafebc.com/research/assets/pdf/sec_report_c.pdf for more information about the 2000–2001 competition.

WCB Research in Action

Although most of the projects funded through the WCB's first annual research competition aren't expected to report final results until the end of 2003 or later, many are already making serious headway.

Nancy Paris-Seeley

New lifting device may lead to reduced injuries among home support workers

With a background in biomedical engineering, Nancy Paris-Seeley is interested in the use of technology to help prevent workplace injuries and aid people in their recovery from injuries. Her work has focused on the design, development, and evaluation of medical and assistive devices. Paris-Seeley is director of the Health Technology Research Group at the B.C. Institute of Technology where she and her fellow researchers are currently developing and testing a mechanical lifting device aimed at reducing the incidence of musculoskeletal injuries among home support workers.

Unlike caregivers in hospitals and nursing homes, home support workers usually work alone in small spaces without the aid of lifting devices. They face an increased risk of musculoskeletal injuries — particularly lower back injuries — because they are often required to lift and carry their patients manually. In fact, between 1997 and 2001, 40 percent of all accepted WCB claims for home support workers, totalling $7.5 million, were caused by overexertion accidents involving patient handling.

Paris-Seeley sees it as a significant problem. One that could get worse as the trend toward home-based care continues to grow.

"Based on existing research, we know that lifts can reduce the risk of injury. Unfortunately, most commercially available lifts are too expensive and too large to use in a client's home. Our goal is to design a smaller, more affordable ergonomic lifting device that can be used with commercially available swings and ceiling tracks," says Paris-Seeley.

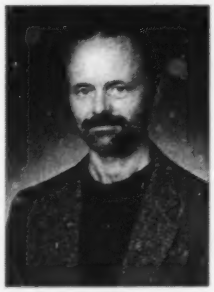
Using a grant from the 2000–2001 research competition, Paris-Seeley and her group designed and tested a prototype that could be made available for much less than the

automated systems currently on the market. The device lifts and transfers patients using a simple gear and pulley system.

To test it in the laboratory, 38 home support workers performed lift and transfer procedures with the device, with a conventional automated system, and without any lift assistance at all. The researchers collected information on the workers' perceptions of comfort, safety, and acceptability while performing the procedures.

"We found that our lifting device was a significant improvement over the manual method of lift and transfer, and approximated the more expensive automated lifts in terms of perceived exertion, ease of use, and safety," says Paris-Seeley. "The results are promising, but further testing is required before we move to commercial production."

With a grant from the 2001–2002 research competition (see page 6), Paris-Seeley and her team are beginning a two-year field study to evaluate the lift in patients' homes. The results will be used to educate decision-makers on the use of lift devices for home support workers. Paris-Seeley and her group have also signed a letter of intent with Waverley Glen Systems Inc., a Canadian lift manufacturer, to explore the commercialization of the mechanical lift device.



Dr. Ralph Mistlberger

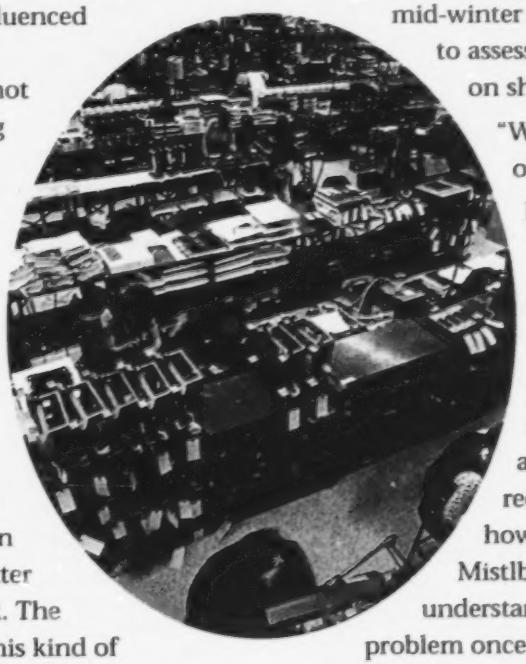
Examining shift work practices in B.C. workplaces

It's estimated that as many as 25 percent of all full-time employed Canadians work shift schedules outside of the standard nine-to-five workday, and the trend is expected to increase over the coming years. While shift work does have advantages for both workers and employers, some shift schedules, particularly rotational shifts that have employees working extended hours at night, can adversely affect workplace health and safety.

Such shift work often requires employees to work and sleep at times that are in opposition to their natural daily cycle. This cycle, also known as the circadian rhythm, influences many of the body's physiological functions, including mood, alertness, digestion, blood pressure, and overall mental and physical acuity. When the circadian rhythm is disrupted, it can lead to stress, sleep loss, fatigue, impaired job performance, increased safety concerns, and, over time, diminished long-term health. There are, however, certain practices that can help minimize disruption and improve employee adaptation.

For the past 14 years, Dr. Ralph Mistlberger, behavioural neuroscientist and professor of

psychology at Simon Fraser University, has been studying what makes our circadian clocks tick, and applying that knowledge to shift work adaptation. With a grant awarded in June 2001, Mistlberger and his associates have set out to assess whether or not advances in optimal shift design have influenced shift schedules used in B.C. workplaces, and whether or not workers are receiving training on how to best adapt.



"We know there are certain environmental and behavioural stimuli that can help workers minimize disruption to their internal clocks," says Mistlberger. "Light, for example, plays a major role in keeping our internal clocks synchronized and, by managing exposure in certain ways, workers can better adapt to late-night shift work. The aim of our study is to see if this kind of knowledge is actually being put to use in B.C. workplaces."

To obtain their data, the researchers are conducting a survey of shift work employers across industry sectors — collecting information on shift work schedules and strategies used to cope with shift work in B.C. The information will be used to construct a provincial database of shift work practices, which will be made available to industry and used by researchers to identify workplaces for future longitudinal studies on optimal shift work adaptation. In addition, Mistlberger and his group are studying shift workers at the Vancouver International Airport during mid-winter and mid-summer months to assess the effect of day-length on shift work adaptation.

"We're still in the process of collecting data, but preliminary results seem to indicate that the majority of workplaces aren't implementing, or in many cases, aren't even aware of best practices in shift work scheduling, and most workers aren't receiving training on how best to adapt," says Mistlberger. "We'll better understand the extent of the problem once we complete our surveying near the end of 2003. In the future, we want to conduct on-site studies to evaluate different shift scheduling and employee training techniques, and look for ways to better transfer research knowledge into the hands of employers where it can be put to practical use."

Dr. Susan Kennedy

Upgraded respiratory health laboratory ready to roll

It may look like a cargo van, but the state-of-the-art equipment contained within is helping researchers better understand work-related factors that contribute to respiratory illness and disease. It's called the Mobile Lung Function Laboratory, run by UBC's Occupational and Environmental Lung Disease Research Unit — an interdisciplinary team of researchers who investigate respiratory illnesses in B.C. workplaces and help employers and workers use the research results to develop prevention strategies.

Dr. Susan Kennedy, epidemiologist and professor in the UBC School of Occupational and Environmental Hygiene and member of the lung research team, says that exposure to airborne toxins and allergens in the workplace can lead to serious respiratory ailments such as asthma and chronic obstructive lung disease. "Such illnesses can be extremely costly in terms of reduced quality of life, time taken away from work, and overall impact on the health care system," she says. "They are preventable, but we first have to identify and evaluate the exact workplace exposures that contribute to these respiratory problems."

The Mobile Lung Function Laboratory is an essential research tool because it allows Kennedy and her colleagues to simultaneously carry out breathing tests and measure air quality at the work site. Using funds awarded from the Secretariat's first research competition, the team upgraded and expanded the capabilities of the Mobile Lung Function Laboratory by replacing the lab's aging computer systems and adding improved pulmonary function testing equipment.

"Over the past five years, much of the lab's equipment had become outdated," says Kennedy. "The pulmonary testing equipment

in particular was no longer compatible with modern computer systems, and if anything broke down it was incredibly difficult to find replacement parts."

To upgrade the lab, Kennedy and her team replaced many of the existing computers as well as the lab's two spirometry systems, which are used to detect the presence of obstructed airways and help determine whether or not there have been changes in lung capacity. Because much of the updated equipment is smaller than before, there was also room to add a new centrifuge and associated equipment, which allows the researchers to capture, store, and measure the chemical content of exhaled breath. According to Kennedy, these improvements will allow researchers to more effectively detect and measure early reversible signs of airway inflammation.

The updated laboratory is being used in a variety of important research initiatives, including a study of theatrical smokes in the performing arts and a new study evaluating the respiratory health of employees in B.C.'s grain elevator industry.

Investigating the link between agricultural chemicals and prostate cancer

Farmers and those who work in agricultural occupations have consistently shown an increased risk for developing prostate cancer — both in Canada and around the world. Although the exact causes are not yet known, potential risk factors include exposure to pesticides, insecticides, fertilizers, herbicides, and other agricultural chemicals.

Dr. Nhu Le, senior scientist and biostatistician in the Cancer Control Research Group at the BC Cancer Agency, has spent most of his professional career researching occupational and environmental factors linked with an increased risk of cancer. Using a grant from the 2000–2001 research competition, he and his colleagues have set out to identify which agricultural chemicals are associated with an increased risk of prostate cancer. During the course of their study, they also plan to evaluate whether or not these substances have the ability to disrupt the endocrine system, and to assess what their role might be in the development and progression of prostate cancer.

"The link between agricultural occupations and the development of prostate cancer has been well established, but there has been little research done on the potential chemical risk factors," says Le. "If we can identify the particular compounds that are associated with an increased risk, then we can begin to develop effective prevention strategies."

Le and his team are using a matched case-control design to conduct the study. Individual exposures to agricultural chemicals are being estimated by linking subjects' lifetime occupational histories with a job exposure matrix, which was recently developed for the agricultural industry in B.C. The researchers are using logistical regression techniques to examine the relationship between the risk of prostate cancer and the exposure to certain agricultural chemicals. Other important confounding factors are also being taken into account.

"We're still in the process of analyzing potential carcinogens, but preliminary results are pointing to a very specific group of compounds," says Le. "The next phase of the research will be to conduct biochemical experiments on these compounds to see if they affect the normal hormonal function of the endocrine system, which can play a role in the development of prostate cancer."

"We plan to finish the first stage of the research by the end of 2002," he says. "Then, depending on the results, we'll conduct further in vitro testing. If we're able to identify active ingredients that contribute to the development of prostate cancer, it may be possible to remove these ingredients from agricultural chemicals or, at the very least, introduce measures to minimize exposure."

WCB Research Advisory Committee

The Research Advisory Committee (RAC) provides advice to the WCB on research priorities and the funding of research projects. The RAC consists of three employer representatives, three worker representatives, and an independent chair. The RAC provides input throughout the research funding process by:

- Providing advice on research priorities
- Reviewing and ranking grant applications
- Making recommendations on the funding of research projects
- Advising the Secretariat on the dissemination and implementation of research outcomes

RAC Members

Employer Representatives

Maurice Fernandes
Industrial health & safety officer
Canada Post

Eric Skowronek
Manager, Health and Safety
B.C. Maritime Employers Association

Bud Britton
Director, Health, Safety and Training
Construction Labour Relations Association

Chair

Richard Gallagher
Head, Cancer Control Research Program
BC Cancer Agency

Worker Representatives

Rod Audia
President, Local 480
United Steelworkers of America

Joe Divitt
Health and safety representative
Canadian Union of Public Employees

Mona Sykes
Occupational health and safety officer
B.C. Government and Service Employees' Union

WCB Representative (ex-officio)

Anya Keefe
Director, Research Secretariat
WCB of B.C.

2003 Funding Opportunities

In 2003, a total of $2 million has been made available to fund research. In addition to funding for operating grants, two new funding streams have been introduced:

Development grants — A development grant provides funding of up to $30,000 for research projects that may not be developed enough to be eligible for full funding through the normal grant competition. The expectation is that these ideas, once explored, may lead to proposals for operating grants further down the road.

Research training awards — Scholarships and training awards will provide funding to graduate students intending to specialize in research on occupational health and safety. Awards will be available at the graduate and doctoral levels.

Research competition timelines:

Call for proposals:
October 2002

Deadline for operating grant applications:
February 17, 2003 at 4:00 p.m. PST

Deadline for development grant applications:
March 31, 2003 at 4:00 p.m. PST

Deadline for research training applications:
April 15, 2003 at 4:00 p.m. PST

Decisions on Funding:
July 2003

For complete details on funding opportunities, including information on competition guidelines and review criteria, refer to the Research Secretariat's web site at www.worksafebc.com/research/.

WCB Research Secretariat

Research Secretariat
Workers' Compensation Board of B.C.
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WORKERS' COMPENSATION BOARD OF BRITISH COLUMBIA

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